capacity as a post-merger competitive constraint, the SAC test using the data available to us for this Declaration suggests that there are unlikely to be unilateral-effects concerns.[62]

D. Efficiencies

124. Unilateral incentives to raise price are reduced if the merger generates significant variable cost reductions.[63] Such reductions would create incentives for the merged firm to reduce its price in order to sell more output. As we have discussed earlier, the merging parties believe that the Sprint-Nextel combination will create substantial synergies between the two firms and that many of these efficiencies will lead to pressure to reduce wireless prices.

125. In Section II of this Declaration, we reviewed the substantial efficiency benefits that the parties have estimated for this merger. These efficiencies have not been estimated on a market-by-market basis. Nonetheless, they provide a significant pro-competitive factor that should be taken into account by the Commission.

E. Conclusions on Unilateral Effects

126. This SAC analysis of competitor repositioning and expansion suggests that there are unlikely to be any markets for which a claim of a significant post-merger unilateral price increase would raise significant competitive concerns. The analysis of diversion ratios does not indicate that Sprint and Nextel are each other's closest competitors. The analysis of efficiencies also suggests that the merger would have pro-competitive tendencies that would deter unilateral price increases. Thus, based on our analysis to date, and subject to the qualifications discussed above regarding the data and assumptions

[62] We also evaluated the SAC for the 16 markets that were identified by the Commission screen but not the 10% adjusted screen. *Each* of the 16 markets has enough SAC to absorb 10% of the share of Sprint Nextel.

[63] This could also take the form of a reduction in the quality-adjusted price if the firm offers better products at the same price.

used in the SAC analysis, we conclude that there are unlikely to be adverse unilateral effects from this merger.

V. Coordinated Effects Analysis

127. In its *Cingular-AT&T Wireless Order*, the Commission also examined the potential for a wireless merger to facilitate anticompetitive coordinated effects, either through explicit or tacit coordination. In its analysis, the Commission considered a number of factors, including the number of firms in a market, transparency of information, firm and product homogeneity, differing positions on the technology path, the presence of mavericks, existing cooperative ventures, and carriers' excess capacity.

128. The Commission concluded that there was no evidence that the wireless competitors had restricted competition through coordinated interaction in specific markets, or that the Cingular-AT&T Wireless combination would make coordinated interaction more likely as a general matter. Indeed, the Commission noted as a general matter that it was "persuaded...that certain characteristics of the mobile telephony market environment, including firm heterogeneity and the presence of carriers with excess spectrum or network capacity, may continue to make it difficult for carriers first to reach terms of coordination and then effectively to detect and punish deviations in specific markets."[64]

129. Moreover, the Commission found it implausible that even a small subset of carriers would be able to reach an enforceable price agreement. In particular, the Commission noted that even though the shares of Verizon Wireless and the post-merger Cingular would become more similar, it was unlikely that even these two wireline-affiliated carriers would be able to coordinate. As the Commission stated, "since Verizon Wireless has already differentiated its brand from rival offerings based on network coverage and voice quality, Cingular may be less willing to agree to restrict competition on

[64] *Cingular-AT&T Wireless Order* ¶ 164.

other terms, such as promotions and advertising, which could offset or narrow this advantage."[65] In that paragraph, the Commission also cited differences in current and future technology positioning, equipment costs, and migration issues that would further complicate efforts to reach coordinated agreement even between the two ILEC-affiliated carriers.

130. In this section, we review the factors raised by the Commission in the context of the Sprint-Nextel transaction. We also examine the role of the efficiency benefits of the transaction and network effects.

131. *Number of Firms*: The merger of Sprint and Nextel will reduce the number of national competitors by one. However, there still will be four national competitors in most large markets and many smaller markets, as well as regional competitors.[66] Moreover, the reduction in the number of firms and increase in concentration is not by itself a sufficient basis for concluding that coordinated interaction is likely in a market like this with no history of coordination. As the Commission stressed in its review of the Cingular-AT&T Wireless transaction, "market share data are the beginning, not the end, of the competitive analysis."[67]

132. *Pricing Transparency:* The Commission observed that carriers regularly monitor their rivals' prices and packaging for residential customers, but that they have little information about rivals' pricing to enterprise customers.[68] This suggests that pricing coordination would be a greater concern for residential customers.

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[65] *Id.* ¶ 157.

[66] *Id.* ¶ 154.

[67] *Id.* ¶ 96.

[68] *Id.* ¶ 154.

133. Although carriers monitor each other's prices, reaching and enforcing an agreement may be complicated by the complexity of pricing plans. For example, we understand that Nextel has at least 25 plans available to consumers and that, within each plan, there are numerous options involving such factors as the size and composition of the minutes in the "bucket" and the charges for overages. Moreover, we understand that numerous firms allow their employees (and their families) to purchase wireless services for their personal and family use through their employers. As a result, any post-merger incentive to raise residential prices may be blunted by the ability of many individuals to acquire wireless service through their employers. In this situation, the high degree of competition for enterprise customers also would constrain the prices charged to individuals when they purchase directly from wireless carriers.

134. *Firm and Product Homogeneity:* Significant asymmetries will remain after the merger of Sprint and Nextel. Products will remain differentiated. Sprint Nextel will have somewhat different incentives because of Nextel's higher share of enterprise customers. In addition, we have already discussed the significant incentive differences that flow from Verizon Wireless' and Cingular's ILEC affiliations. These differences in firm characteristics are obstacles to any post-merger effort to coordinate pricing.

135. *Technology Development and Competition:* Coordinated interaction is less likely to succeed in wireless telephony because of the dynamic nature of the market. The wireless market has been, and continues to be, in the process of technological change as carriers deploy 2.5G and 3G services, and the robustness of consumer demand for these services is uncertain. In addition, the differences in the positioning of the firms on their technology paths will remain substantial following the merger and will continue to complicate pricing agreement and enforcement. Finally, investments in

these markets are quite lumpy. This is the kind of dynamic market environment that is not conducive to successful tacit coordination.

136. *Network Effects:* The wireless market also is subject to network effects because of the lower costs to the carrier of on-net calls and the customer benefits of push-to-talk calls.[69] The desire to create network effects increases the benefits of deviating from a coordinated outcome. Although the Commission suggests that network effects have not had a significant impact so far, they are yet another factor that would complicate coordination.[70]

137. *Mavericks:* The Commission noted in its review of the Cingular-AT&T Wireless transaction that regional carriers would remain potential mavericks.[71] In addition, the Commission concluded that "no single nationwide carrier is uniquely positioned to be a maverick."[72] Indeed, it concluded that even Verizon Wireless and Cingular may be mavericks in some markets.[73] These same points will remain equally valid after the merger of Sprint and Nextel. Thus, this merger does not involve the acquisition of a unique maverick.

138. *Cooperative Ventures:* The Commission raised concerns about cross-ownership arrangements.[74] These concerns would not appear to apply to the Sprint-Nextel merger. In addition, we have counted Sprint affiliates and Nextel Partners as part of the merged firm in our analysis.

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[69] "Network effects arise when the value of a product increases with the number of consumers who purchase it." *Id.* ¶ 143.

[70] *Id.* ¶ 145.

[71] *Id.* ¶ 161.

[72] *Id.* ¶ 162.

[73] *Id.* ¶ 162.

[74] *Id.* ¶ 163.

139. *Efficiencies:* The efficiencies created by the Sprint-Nextel merger will make coordinated interaction less likely. By reducing its costs, the newly merged firm will have a greater incentive to deviate from a proposed coordinated outcome and expand its output instead.

140. *Spectrum Capacity:* Attempts to coordinate are less likely to succeed if rivals have sufficient capacity to expand without any significant increase in incremental costs or reduction in the quality of service. The availability of that capacity would increase incentives to defect from the terms of coordination. It also would permit firms that are not part of the coordinating group to reposition and expand in response to price increases and output restrictions by the coordinating group. As the Commission noted, "a rival carrier may have a strong incentive to deviate from the terms of coordination if it has excess spectrum and (or) network capacity relative to the traffic generated by its existing customer base."[75]

141. We have already discussed the SAC algorithm for measuring the ability of carriers to absorb additional subscribers and applied it to the unilateral effects analysis. In this section, we employ the SAC methodology to evaluate the potential for successful coordination between the two leading firms in a market.[76] We estimate whether the remaining smaller firms, who are not part of the assumed coordinating group, will have sufficient SAC to absorb 10% of the *combined* shares of the two leading firms, if they were to attempt a coordinated price increase. The SAC analysis of coordinated effects is subject to the same caveats and data limitations discussed with respect to unilateral effects.

142. We have applied the SAC methodology to the subset of the 79 Telephia markets identified by the adjusted structural screen where Sprint Nextel would be one of the two leading firms.

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[75] *Id.* ¶ 187.

[76] As noted earlier with respect to unilateral effects, failure to satisfy the SAC test does not necessarily mean that a coordinated price increase would be profitable.

This identifies a total of 61 markets.[77] The combined subscriber share of the two leading carriers in these markets ranges from a low of [ ] for Sarasota FL to a high of [ ] in Wilson TX. Although the hypothetical coordinating firms likely would not be able to reach agreement unless both of their market shares are high, we applied the algorithm to all of these markets, not just those that satisfied some particular market share threshold. The results of our calculations appear in Table 12.[78]

143. To illustrate the application of the SAC methodology to coordination by the two leading firms, consider the example of St. Louis. In this market, the combined share of Sprint Nextel and Cingular-AT&T Wireless (the other leading firm) will be [ ]. Using the Commission's 10% output reduction standard, the issue is whether the other smaller carriers have sufficient SAC to absorb [ ] share points in the event of a hypothetical coordinated price increase by these two firms. The SAC methodology described earlier suggests that the remaining carriers could absorb an additional [ ] share points, or about 2.8 times the capacity required to absorb the [ ] share point output reduction (i.e., [ ]/[ ]). Therefore, the SAC algorithm suggests that pricing coordination will be unlikely to succeed in the St. Louis market in the face of repositioning and expansion by rivals.

144. The SAC methodology for coordinated effects indicates that rivals are able to absorb the requisite share point output reduction in 55 of the 61 markets that we analyzed. In only six markets, Hammond LA, Kansas City, Minneapolis, Houston, Chicago, and Wilson TX is this not the case.

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[77] Whether or not the Commission chooses to use our adjustments to its structural screens, the Commission's competitive analysis should still recognize the differences between this transaction and the Cingular-AT&T Wireless transaction in its public interest evaluation, including the differences resulting from the lack of ILEC affiliation, the more credible efficiency benefits, and the differences in spectrum holdings.

[78] Note that we have spectrum data for the leading carriers only for the top 106 markets. For others, we have only the spectrum holdings of Sprint and Nextel. In markets that were identified by our 10% adjusted screen, we assume that the non-Sprint Nextel member of the two leading firm group has a spectrum share proportional to its subscriber share. This assumption may lead to inaccurate results in some cases.

However, there are several reasons why there are unlikely to be coordinated effects problems even in these six markets.

145. *Minneapolis:* We have already discussed Minneapolis in the unilateral effects section. We note here that the assumptions used for applying the SAC methodology to the potential for coordination between Sprint Nextel and Verizon, the other leading firm in Minneapolis, produce the implausible result that the estimated SAC is negative. Interpreted literally, this would mean that the rivals in these two markets lack enough spectrum even to support the subscriber shares that they currently have. This result occurs because the maximum ratio of subscriber share to spectrum share estimated for Minneapolis is only 1.09, far lower than the ratio found for many large markets.[79] If even a modestly higher ratio (of 1.28) had been applied to Minneapolis, the resulting SAC would have been sufficient to absorb all the necessary subscribers. Similarly, if even a small subscriber cushion had been assumed, the same result would be obtained.

146. Moreover, further economic analysis of Minneapolis suggests that there would not be a coordinated effects issue in this market. First, additional spectrum will be added in Minneapolis as a result of Auction 58. This additional spectrum can increase the SAC of smaller rivals and increase their ability to deter post-merger coordinated price increases. For example, if rivals obtain only 11 MHz of the 40 MHz being auctioned for Minneapolis, that alone will be sufficient to absorb the requisite subscriber share. Second, the Commission expressed its greatest concern about coordinated effects in markets with only two competitors.[80] In Minneapolis, all four national firms will be present after the Sprint-Nextel merger, all of which will have subscriber shares of at least [ ]. In fact, Sprint Nextel and Verizon Wireless will have a combined share of only [ ]. This means that the smaller non-

[79] In this regard, we note that the data set for Minneapolis was incomplete. Some rival carriers have subscriber shares but had no reported spectrum holdings in the data set that we used.

[80] *Cingular-AT&T Wireless Order* ¶ 191.

coordinating firms already supply over [ ] of subscribers. This factor would make attempted coordination between the two leading firms less likely to succeed.

147. *Kansas City:* A similar economic analysis applies to this market. First, additional spectrum will be added in Kansas City in Auction 58. In fact, if rivals obtain only 11 MHz of the 30 MHz being offered in Kansas City, that alone would be sufficient to absorb 10 percent of the subscribers of the two leading firms. Second, in Kansas City, Sprint Nextel and Cingular will have a combined share of only [ ]. This means that non-coordinating firms currently have a combined share of almost [ ] of subscribers, which will make coordination between the two leading firms less likely to succeed. In addition, all four national firms will be present in Kansas City and each will have a subscriber share of at least [ ] after the merger.

148. *Chicago:* No additional spectrum will be added in Chicago in Auction 58. However, in Chicago, Sprint Nextel and Cingular will have a combined share of only [ ]. This means that non-coordinating firms already supply more than [ ] of subscribers, which would make attempted coordination between the two leading firms less likely to succeed. In terms of number of firms, there will be five firms present in Chicago with subscriber shares of at least [ ] after the merger, the four national firms plus US Cellular, which has a market share of [ ].

149. *Houston:* As in the case of Minneapolis, we estimated a negative value for SAC, which suggests that the maximum ratio of subscriber share to spectrum share, 1.18, used in the SAC calculation, may be too low. If that ratio had been only modestly higher (at 1.36), rivals would have sufficient SAC to absorb 10% of the subscribers of the two leading firms. Beyond the SAC test, similar economic analysis applies to this market. First, additional spectrum will be added in Houston in Auction 58. In fact, if rivals obtain 12 MHz of the 20 MHz being offered in Houston, this alone would be sufficient to absorb all the necessary subscribers. Second, in Houston, Sprint Nextel and Cingular will

have a combined share of only [ ]. This means that non-coordinating firms already supply more than [ ] of the subscriber share, which would make coordination between the two leading firms less likely to succeed. In Houston, all four national firms will be present after the merger, each with a share of at least [ ].

150. *Wilson TX and Hammond LA:* The SAC results for both Wilson TX and Hammond LA are distorted by the data limitations we faced. The assumptions that we made result in a significant overestimate of Cingular-AT&T Wireless' combined spectrum share, which were estimated to be in excess of 80 MHz in both markets. Once those overestimates are corrected, both of these small markets pass the SAC test by a substantial margin.[81]

151. Based on the Commission's methodology and our SAC analysis to date, there are unlikely to be coordinated effects problems resulting from this merger. In the 55 of the 61 Telephia markets where Sprint Nextel would be one of the two leading firms, the SAC test indicated that rival carriers had sufficient capacity to absorb at least 10 percent of the subscribers of the two leading firms, if those firms were to attempt to raise their prices after the merger. For the four large markets for which this is not the case, other economic factors, together with the use of assumptions that are more

[81] As discussed earlier, we do not know the spectrum holdings of any carriers other than Sprint Nextel for the Telephia markets outside the top 106 markets. Therefore, we used information from these larger markets to estimate the "full capacity" subscriber share/spectrum share ratio. In addition, for the coordinated effects analysis for these smaller markets, we had to estimate the spectrum holdings of the other leading firm. To do so, we assigned the spectrum share not held by Sprint Nextel to the other leading carrier in proportion to its subscriber share in that market. This methodology leads to an overestimate of the spectrum holdings of Cingular-AT&T Wireless, which are found to exceed 80 MHz using this assignment methodology. We understand that Cingular-AT&T Wireless will not have more than 80 MHz in any market after the merger. *Cingular-AT&T Order,* note 103. Assuming, therefore, that Cingular has no more than 80 MHz in these two markets, the SAC in Wilson is more than 6 times the amount required to absorb 10% of the combined shares of the two leading carriers ([ ] share points). In Hammond, the assumption results in a SAC that is 5 times the amount necessary to absorb 10% of the combined shares of the two leading firms in this market (i.e., [ ] share points). It is possible that a similar overestimate would apply to some other markets in which Sprint Nextel is not one of the two leading firms.

appropriate to these markets, indicate that there are unlikely to be significant coordinated effects issues. Finally, in Hammond LA and Wilson TX, the initial SAC test was distorted by incomplete spectrum holdings data. After correcting for this distortion, however, these two small markets passed the SAC test.[82]

VI. Intermodal Competition

152. In its *Cingular-AT&T Wireless Order*, the Commission raised concerns about the impact of that merger on intermodal competition.[83] In this Declaration, we have already discussed the fact that a wireless carrier that is owned by a significant ILEC has the incentive to charge higher wireless and wireline prices. We also have discussed the fact that the integrated ILEC has the incentive to charge higher access prices and to degrade the access that it offers to its local exchange network to wireless competitors. Integrated firms also have potential marketing advantages from their ability to bundle wireline and wireless services.

153. In its analysis of the Cingular-AT&T Wireless transaction, the Commission concluded that the potential public interest harms from a loss in intermodal competition are currently quite limited

[82] We also examined those 16 Telephia markets that were identified by the Commission's screen, but not by our 10% adjusted screen. Sprint Nextel would be one of the two leading firms in only 5 of these markets. In only 2 of these 5 markets does our estimate of the SAC indicate that rivals would have insufficient capacity to absorb 10% of the subscribers of the two leading firms. In Tampa, one of these two markets, the combined shares of the two leading firms is less than [ ] and there will be 5 firms with market shares of at least [ ]. In addition, the SAC calculation is negative, highlighting the limitations of this approach discussed earlier. In San Antonio, the maximum ratio of subscriber share to spectrum share is just above unity (1.06), which, like Minneapolis, should be viewed as implausibly low. If that ratio were raised to only 1.15, the rivals of the two leading firms would have sufficient spectrum capacity to absorb 10% of the combined share of the two leading firms. In addition, we understand that 30 MHz of spectrum in San Antonio will be made available in Auction 58. If non-coordinating carriers would obtain at least 12 MHz in these auctions, that alone would be sufficient for them to absorb the requisite number of subscribers of the two leading carriers. In all of these markets, we only considered coordination between the two leading firms, because coordination among more than two firms would face even greater obstacles. See *Cingular-AT&T Wireless Order* ¶ 191.

[83] *Cingular-AT&T Wireless Order* ¶¶ 237-246.

and would be outweighed by public interest benefits.[84] However, it cautioned that it would continue to monitor the market to ensure that independent wireless competitors and intermodal competition would not be impeded.[85] In this regard, the merger of Sprint and Nextel should facilitate, rather than diminish, intermodal competition by increasing the ability of these independent wireless competitors to reduce their costs, improve their product offerings, and compete more effectively.

VII. Conclusions

154. The merger of Sprint and Nextel is unlikely to raise significant competitive concerns. The merger will produce a number of efficiencies that will reduce the cost of serving additional subscribers or producing extra minutes of service, and improve the quality of the service that is offered by Sprint Nextel. Thus, these efficiencies will directly benefit wireless subscribers and increase wireless competition. Many of these efficiencies likely would not have occurred absent the merger or would not have occurred as quickly. Therefore, they are merger-specific.

155. The initial structural screens used by the Commission for identifying markets for further analysis in the Cingular-AT&T Wireless transaction would not identify most of the local geographic markets that appear in the Telephia data that we have analyzed. Even fewer Telephia markets would be identified if the structural screens were adjusted to reflect significant differences between the two transactions, especially the fact that Sprint Nextel will not be affiliated with one of the leading local exchange carriers.

156. In the local markets where more detailed competitive analysis would be required by the structural screens, there seems little likelihood that the merger will give Sprint Nextel an incentive to raise prices unilaterally. Sprint and Nextel do not appear to be especially close substitutes, nor would

[84] *Id.* ¶¶ 247-249.

[85] *Id.* ¶ 250.

Sprint Nextel be the leading firm in most markets. Rival carriers also appear to have sufficient capacity to absorb a significant number of additional subscribers in the event of an attempted unilateral price increase by Sprint Nextel, even in screen-identified markets in which the Sprint Nextel share is large. The potential for output expansion by rivals will, therefore, deter the merged firm from raising prices. Taken together with the efficiencies that the merger is expected to produce, these factors make unilateral price increases unlikely.

157. Similarly, based on our analysis to date, we conclude that there is little concern that the merger could increase the likelihood of coordination among the leading firms. Pricing to enterprise customers does not appear to be transparent. There are now, and will remain, substantial asymmetries among wireless carriers, including the fact that only some carriers are affiliated with ILECs and the fact that the carriers are situated differently on their technology paths. Moreover, there appears to be sufficient capacity to discipline attempts to coordinate price increases by the two leading firms in a market. Given these factors and the expected efficiencies, coordinated price increases also seem unlikely. Closer examination of those few markets where the SAC is inadequate suggests that even in these markets, the merger is not likely to lead to pricing coordination. Moreover, the merger will not decrease intermodal competition and more likely will increase it by permitting Sprint Nextel to become more efficient.

APPENDIX 1

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1992–present	*Vice President*, Charles River Associates, Washington, DC.
1980–1992	*Senior Economist*, The RAND Corporation, Washington, DC.
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1985–1988	*Co-editor, RAND Journal of Economics*.
1978–1980	*Co-director*, Network Inquiry Special Staff, Federal Communications Commission.
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1965–1980	*Assistant Professor, Associate Professor, Professor of Economics, Allyn R. and Gladys M. Cline Professor of Economics and Finance*, Rice University.
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CONSULTANCIES

1972–1978	The RAND Corporation
1972–1977	Office of Telecommunications Policy, Executive Office of the President
1975	Texoma Regional Planning Commission
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PROFESSIONAL ACTIVITIES/HONORS

Member, National Research Council Board on Earth Sciences and Resources, Division on Earth and Life Studies, Committee on Licensing Geographic Data and Services, 2002–2004

Member, The National Academies Computer Science and Telecommunications Board Committee on Internet Searching and the Domain Name System, 2001–2004

Member, Editorial Board, *Information Economics and Policy*, 1992–2004

Member, Editorial Board, *Economics of Innovation and New Technology*, 1989–present

Member, U.S. National Committee on Data for Science and Technology (CODATA), National Academy of Sciences/National Research Council, 1993–1996

Member, Office of Technology Assessment Advisory Panel on Communications Systems for an Information Age, 1986-1988

Member, Regional Telecommunications Planning Advisory Committee, City of Cincinnati, 1985

Member, Office of Technology Assessment Advisory Panel on Intellectual Property Rights in an Age of Electronics and Information, 1984-1985

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Listed in *Who's Who in America*, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005

Member, Editorial Board, *Southern Economic Journal*, 1979-1981

Member, Task Force on National Telecommunications Policy Making, Aspen Institute Program on Communications and Society, 1977

Brookings Economic Policy Fellow, 1971-1972

Member, Technical Advisory Committee on Business Development, Model City Program, City of Houston, 1969-1971

Wilson University Fellow, 1959-1961

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Beta Gamma Sigma, 1958

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CONGRESSIONAL TESTIMONY

Witness, Subcommittee on Intellectual Property and Judicial Administration, Committee on the Judiciary, US House of Representatives, 1991. Prepared statement and testimony appear in *Intellectual Property and International Issues*, 102nd Congress, 1st Session.

Witness, Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce, US House of Representatives, 1990. Prepared statement and testimony appear in *Cable Television Regulation (Part 2)*, 101st Congress, 2nd Session.

Witness, Subcommittee on Telecommunications, Consumer Protection, and Finance, Committee on Energy and Commerce, US House of Representatives, 1983. Prepared statement and testimony appear in *Options for Cable Legislation*, 98th Congress, 1st Session.

Witness, Subcommittee on Communications, Committee on Commerce, Science, and Transportation, US Senate, 1982. Prepared statement and testimony appear in *Cable Television Regulation*, 97th Congress, 2nd Session.

Witness, Subcommittee on Telecommunications, Consumer Protection, and Finance, Committee on Energy and Commerce, US House of Representatives, 1981. Prepared statement and testimony appear in *Status of Competition and Deregulation in the Telecommunications Industry*, 97th Congress, 1st Session.

Witness, Subcommittee on General Oversight and Minority Enterprise, Committee on Small Business, US House of Representatives, 1980. Prepared statement and testimony appear in *Media Concentration (Part 1)*, 96th Congress, 2nd Session.

Witness, Subcommittee on Communications, Committee on Commerce, Science, and Transportation, US Senate, 1977. Prepared statement and testimony appear in *Cable Television*, 95th Congress, 1st Session.

Witness, Subcommittee on Communications, Committee on Interstate and Foreign Commerce, US House of Representatives, 1976. Prepared statement and testimony appear in *Cable Television Regulation Oversight (Part 1)*, 94th Congress, 2nd Session.

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FIELDS OF SPECIALIZATION

Industrial Organization
Competition and Antitrust Policy
Economics of Information
Law and Economics

EMPLOYMENT EXPERIENCE

***Current Position*: Professor of Economics and Law, Georgetown University Law Center (at GULC since August 1981).**

Guest Scholar, Brookings Institution, 1990–1991.

Visiting Professor, Massachusetts Institute of Technology, Spring 1986.

Visiting Interdisciplinary Professor, Georgetown University Law Center, July 1981–June 1982.

Associate Director for Special Projects, Bureau of Economics, Federal Trade Commission, January 1980–June 1981.

Assistant Director for Industry Analysis, Bureau of Economics, Federal Trade Commission, September 1979–January 1980.

Deputy Assistant Director for Consumer Protection, Bureau of Economics, Federal Trade Commission, December 1978–September 1979.

Economist, Division of Consumer Protection, Bureau of Economics, Federal Trade Commission, July 1978–December 1978.

Economist, Office of Economic Analysis, Civil Aeronautics Board, September 1977–July 1978.

Economist, Federal Reserve Board, July 1972–September 1977.

Adjunct Professor, Department of Economics, University of Pennsylvania, September 1977– June 1978.

Adjunct Professor, Department of Economics, George Washington University, September 1975–January 1978.

SELECTED PROFESSIONAL ACTIVITIES

Consultant, FTC Joint Venture Project (1999).

Advisory Committee, FTC Hearings on Global and Innovation-Based Competition (1996).

Associate Editor (Industrial Organization), *Journal of Economic Perspectives* (1987–1993).

American Bar Association Antitrust Task Force on Second Requests (1990).

Advisory Board, Georgetown Project on Treble Damages (1986–1987).

Associate Editor, *Journal of Industrial Economics* (1983–1988).

Associate Editor, *International Journal of Industrial Organization* (1984–1989).

Secretary, Antitrust Section, American Association of Law Schools (1983–1984).

Memberships: American Economic Association, American Bar Association, Phi Beta Kappa.

Nominating Committee: American Economic Association, 1982.

Economics Editorial Advisor, *Journal of Consumer Research*, 1982.

OTHER ACTIVITIES

Board of Directors, Charles River Associates Incorporated.

Management Advisory Committee, La Leche League International (1994–1999).

Board of Trustees, The Lowell School (1989–1995).

HONORS AND AWARDS

NSF Graduate Fellowship, 1968–1972.

Graduated *summa cum laude*, with Honors in Economics, from the University of Pennsylvania, 1968.

Schoenbaum Prize in Economics, University of Pennsylvania, 1968.